

RECENT DISCOVERIES IN THE NEWFOUNDLAND FLORA

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(Continued from page 107)

Contrasted with the amazingly temperate flora of the peaty tablelands of western Newfoundland, where groups with pronounced austral affinities prevail, there is the abundance at or close to sea-level on the bleak outer coast of western Newfoundland of the arctic and arctic-alpine species. On the exposed coast between latitudes 52° and 48°, from Cape Norman to Cape St. George (and in some cases even southward to Cape Ray), the following members of the flora of the American Arctic Archipelago or of Arctic Greenland (well within the Arctic Circle) occur at or within 100 m. of sea-level. Their latitudinal limits of range on the Atlantic slope of America, as closely as can be determined from the data at hand, is approximately given (omitting fractions of degrees):

Woodsia glabella R. Br. (83°-42°), *Asplenium viride* Huds. (82°-43°), *Festuca brachyphylla* Schultes (82°-44°), *F. vivipara* (L.) Sm. (75°-48°), *F. rubra* var. *arenaria* (Osbeck) Fries (70°-49°), *Poa alpina* L. (76°-47°), *Calamagrostis canadensis* var. *Langsdorfi* (Link) Inman (71°-44°), *C. neglecta* (Ehrh.) Gaertn., Meyer & Scherb. (76°-44°), *Alopecurus aequalis* var. *natans* (Wahlenb.) Fern. (71°-51°), *Hierochloa alpina* (Lilj.) R. & S. (83°-44°), *Eriophorum Scheuchzeri* Hoppe (83°-51°), *Kobresia simpliciuscula* (Wahlenb.) Mackenz. (81°-48°), *Carex capitata* (76°-44°), *C. incurva* Light. (82°-51°), *C. bipartita* All. (76°-49°), *C. glauca* Wahlenb. (80°-47°), *C. rupestris* All. (81°-48°), *C. scirpoidea* Michx. (76°-43°), *C. glacialis* Mackenz. (79°-48°), *C. bicolor* All. (71°-50°), *C. capillaris* L. (80°-44°), *C. rariflora* (Wahlenb.) Sm. (76°-46°), *C. alpina* Swartz (76°-49°), *C. concolor* R. Br. (81°-44°), *C. microglochin* Wahlenb. (72°-50°), *Juncus trifidus* L. (72°-43°), *J. albescens* (Lange) Fern. (81°-48°), *Luzula spicata* (L.) DC. (76°-44°), *L. campestris* var. *alpina* Gaudin (70°-49°), *Tofieldia minima* (Hill) Druce (76°-48°), *Habenaria straminea* Fern. (69°-51°), *Salix reticulata* L. (73°-51°), *S. arctophila* Cockerell (77°-48°), *Oxyria digyna* (L.) Hill (83°-44°), *Polygonum viviparum* L. (83°-44°), *Arenaria verna* var. *pubescens* (C. & S.) Fern. (83°-44°), *A. cylindrocarpa* Fern. (80°-49°), *Cerastium alpinum* L. (83°-51°), *Lychnis alpina* L. (76°-48°), *Silene acaulis* var. *exscapa* (All.) DC. (83°-44°), *Ranunculus hyperboreus* Rottb. (83°-50°), *R. pedatifidus* var. *leiocarpus* (Trautv.) Fern. (80°-51°), *Thalictrum alpinum* L. (73°-48°), *Cochlearia groenlandica* (83°-51°), *Cardamine pratensis* var. *angustifolia* Hook. (81°-50°), *Draba nivalis* Lilj. (83°-49°), *D. incana* L. (70°-47°), *D. hirta* L. (81°-48°), *D. rupestris* R.

Br. (76°–47°), *Arabis alpina* L. (76°–48°), *Saxifraga cespitosa* L. (83°–48°), *S. aizoides* L. (78°–44°), *S. Aizoon* Jacq. (76°–44°), *S. oppositifolia* L. (85°–44°), *Potentilla nivea* L. (83°–48°), *P. alpestris* Hall. f. (74°–48°), *Dryas integrifolia* Vahl (83°–48°), *Astragalus alpinus* L. (73°–49°), *Epilobium latifolium* L. (83°–48°), *E. lactiflorum* Haussk. (71°–44°), *E. alpinum* L. (73°–46°), *E. Hornemanni* Reichenb. (70°–44°), *Rhododendron lapponicum* (L.) Wahlenb. (81°–44°), *Loiseleuria procumbens* (L.) Desv. (74°–44°), *Arctostaphylos alpina* (L.) Spreng. (76°–44°), *Vaccinium uliginosum* var. *alpinum* Bigel. (81°–44°), *Diapensia lapponica* L. (82°–44°), *Statice labradorica* var. *submutica* Blake (78°–49°), *Euphrasia arctica* Lange (76°–48°), *Bartsia alpina* L. (76°–51°), *Pedicularis flammea* L. (81°–49°), *Gnaphalium norvegicum* Gunn. (72°–49°), *Artemisia borealis* Pall. (76°–48°), *Taraxacum phymatocarpum* (83°–51°) and *Crepis nana* Hook. (70°–51°).

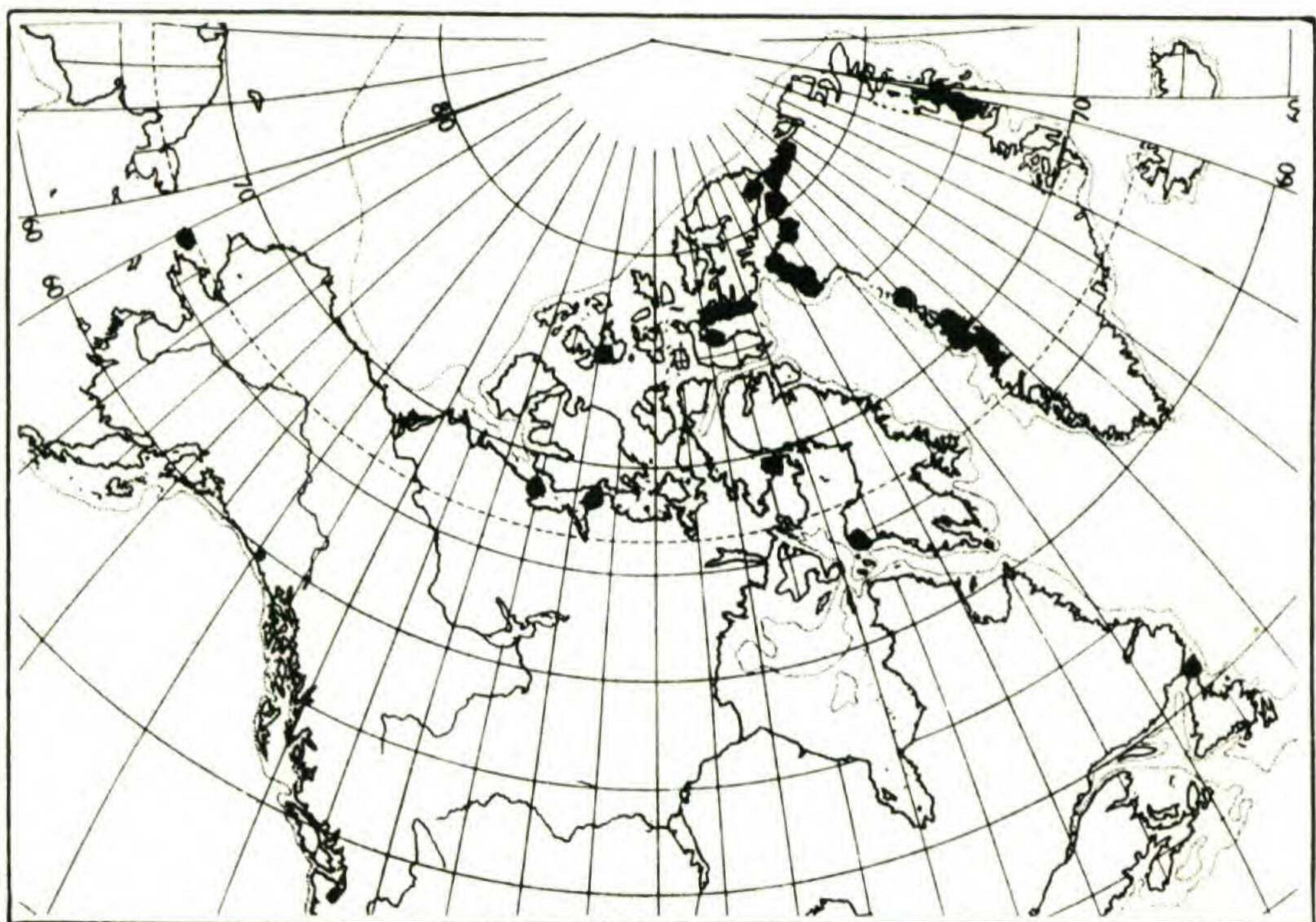
That is a highly impressive list for sea-level between latitudes 52° and 48°, and, were I to include species like *Lycopodium Selago*, *Scirpus cespitosus* var. *callosus* Bigel., *Stellaria humifusa*, *Sedum roseum*, *Empetrum nigrum* and others which reach the New England coast, it would be greatly extended (to 49½ percent of the entire flora of the Archipelago, as enumerated by Simmons). Nor does this arctic flora extend continuously from arctic Greenland or Ellesmereland to western Newfoundland *via* the coast of Labrador. A large proportion of the species are quite unknown on “the Labrador” from Nain (approximately lat. 56°) southward and one or two are not even known from the mountain walls and crests of northernmost Labrador (the Kiglapaits and the Torngats): for example *Taraxacum phymatocarpum* (MAP 12). In describing a dramatic day in 1925 on Burnt Cape (Pistolet Bay), where we first found the Greenland *Habenaria straminea* (unknown between Greenland and northern Newfoundland), I wrote: “When the scattered members of the party assembled at the crest [alt. 223 ft. or 65 m.] . . . I was picking from the crevices a *Taraxacum* which, in its small blackish involucre, was unlike anything we had seen before.”¹ I made it out to be the hyparctic *T. phymatocarpum*, known, as stated by Simmons, only in “Northern Greenland, Ellesmereland,” but subsequently found southward to lat. 67° in Greenland and lat. 64° on Baffin Island.

Distrusting my own identification, for the species is not known on Labrador, and in northwestern Newfoundland it is within only 223 feet (65 m.) of the sea, I divided the scanty material and sent some to my friend, Dr. Handel-Mazzetti, at Vienna, whose *Monographie der*

¹ RHODORA, xxviii. 103 (1926).

Gattung Taraxacum (1907) had put the genus in order. His reply was wholly corroborative and when, later, I sent a series to the great Stockholm specialist, Dr. Dahlstedt, I also received a similar reply, Dahlstedt referring "No. 29254 ad *T. phymatocarpum* Vahl, verum."¹

The contrast, then, between the bleak and rocky coastal rim and foreland of western Newfoundland and the peaty tablelands is complete. At both levels the ubiquitous Hudsonian and Canadian types form a generalized background: a forest or scrub of *Picea*



Map 12. American Range of TARAXACUM PHYMATOCARPUM.

mariana and *P. glauca* Voss, *Abies balsamea*, *Larix laricina*, *Betula papyrifera* and smaller species, *Pyrus* § *Sorbus* and *Populus tacamahacca*, with *Alnus crispa* (or its var. *mollis*), *Salix* (many species), *Ribes glandulosum*, *Viburnum pauciflorum*, *Potentilla fruticosa*, *Lonicera villosa*, etc., with the usual Canadian filicoid and herbaceous

¹ The western Newfoundland and Gaspé collections contain much *Taraxacum lapponicum* Kihlm. In view of the present interpretation of the antiquity of the flora of these areas it was reassuring that Dr. Dahlstedt should write (*in lit.* November 14, 1927): "It has been very interesting to find that *T. lapponicum* (= *T. croceum* Dt.) is distributed also in arctic North America. This collective species . . . is widely distributed in northern and alpine parts of Fennoskandia and occurs also on Iceland and Greenland. It seems to me to be a very old species which surely inhabited the recently covered countries long before the last Skandinavian glaciation."

undergrowth; and the usual Canadian bog plants, with the addition of the almost ubiquitous *Betula Michauxii*, the superabundant *Sanguisorba canadensis* and the usually common *Eriophorum spissum* var. *erubescens* Fern. With this very generalized element almost everywhere, the truly distinctive floras are likely at first to remain masked to the uninitiated; but, once the common run of generally distributed and aggressive species is dismissed from consideration, the flora of the West Coast otherwise quickly segregates into the two contrasted elements which I have sufficiently emphasized: the arctic-alpine dominant at sea-level, the austral dominant on peaty summit-tablelands. The absence or great rarity of many, and often of all, of the Coastal Plain plants at low altitudes from Cape St. George northward is due, presumably, to the extensive calcareous area which makes up most of the lower levels and to the highly magnesian rock of portions of the Lewis Hills and Blomidon and between the North Arm (of Bay of Islands) and Bonne Bay, these furnishing soils toxic, or at least uninviting, to most of the Coastal Plain species. Farther inland and southward, where granitic, gneissic and other silicious rocks prevail, the plants of the acid peats of the tablelands have found welcoming conditions at lower levels, southward even at sea-level.

In an earlier paper, commenting on the close proximity, in some areas, of the arctic and the austral elements in the flora, I said: "In western Newfoundland, similarly, it is quite possible to stand on rock-barrens carpeted with the arctic xerophytes . . . and, by stepping a few feet into the adjacent bogs, meadows, brooksides or thickets, to find one's self in the midst of . . . plants of temperate or even austral range. . . . This intimate commingling of southern species (even Carolinian in some instances) with plants which characterize the Arctic seems, in Newfoundland at least, to be due to the differences of habitat which the two series affect. The arctic types prevail on the dry rocks or on windswept crests, *i. e.* they are primarily controlled in their southern distribution by aridity and bleakness, the climatic features most obviously distinguishing the unglaciated Arctic areas. In describing the climate of the Arctic [American] Archipelago, which, as we have seen, is essentially unglaciated, Simmons says, 'The most prominent and important factor I take its extreme dryness to be,' and this is certainly the most prominent factor in the isolated southern habitats of the arctic plants.

But in Newfoundland, bogs, wet thickets, brooksides and meadows are characterized by southern types and it is in such favorable habitats that all notable extensions [northward] of southern species occur."¹

Still later, in corroboration of Simmons's statement, that on the American Arctic Archipelago, "The most prominent and important factor I take its extreme dryness to be,"² I quoted from Stefansson's *The Friendly Arctic*, Chap. II: "Most of what little snow falls in the far North is soon swept by the wind into the gullies and into the lee of the hills, so that from seventy-five to ninety per cent. of the surface of arctic land is comparatively free from snow at all seasons a pebble the size of a plum lying on the ground would have more than an even chance of being partly visible above the snow"; and I further wrote: "If a purely botanical demonstration of the rarity rather than the abundance of lakes and swamps [on the unglaciated Arctic Archipelago] were needed an alert phytogeographer would quickly detect it in the absence of freshwater hydrophytes. Simmons admits 204 species of vascular plants to the flora of the Arctic Archipelago, mostly extreme xerophytes, with no true hydrophytes: no species of *Isoetes*, *Sparganium*, *Potamogeton*, *Callitriche*, *Myriophyllum* or *Utricularia*. Similarly, all these groups of aquatics were quite unmentioned either in the detailed lists of the floras of arctic Siberia and the Asiatic side of Bering Straits published by Kjellman or in Lynge's very exhaustive study of the Flora of Nova Zembla, an arctic land which was untouched by the different advances of the continental ice-sheets of Europe. But in glaciated Greenland they all occur, there extending northward on the abundantly watered foreland to points varying for the different species from lat. 68° to 72°. Furthermore, the boreal members of the great genus *Epilobium* (excluding § *Chamaenerium*) are typically plants of wet habitats; and, if the Arctic in general were as wet as Campbell and his outgrown sources of information make out, we should expect these wind-dispersed *Epilobiums* to be everywhere in the Arctic. In wet Greenland they do occur, extending north to lat. 73°, but the Nordenskiöld expedition got none of them on the arctic coast of Siberia (lat. 66°-77°) and Simmons could muster only a single doubtful record for the entire Arctic Archipelago."³

¹ Fernald, Mem. Am. Acad. xv. 332 (1925).

² Herman G. Simmons, *A Survey of the Phytogeography of the Arctic Archipelago*, Lunds Univ. Årsskr. n. f. Afd. 2, Bd. 9, Nr. 19: 30 (1913).

³ Fernald, *Campbell's Outline of Plant Geography* (Review), Ecology, vii. 513 (1926)

With the exception of three positive hydrophytes (*Alopecurus aequalis* var. *natans*, *Eriophorum Scheuchzeri* and *Ranunculus hyperboreus*) and a few plants of damp pockets, meadows or shores (*Calamagrostis*, *Carex glauca*, *bicolor*, *rariflora* and *microglochin*, *Juncus albescens*, *Habenaria straminea*, *Thalictrum alpinum*, *Cardamine*, *Epilobium lactiflorum*, *Bartsia alpina*, etc.), mostly plants of Greenland rather than of the Arctic Archipelago, the truly Arctic species (and their endemic relatives) in Newfoundland are chiefly xerophytes and they are all plants of open and exposed habitats. No better illustrations of the arid condition of this outer coast can be given than the limestone barrens about Old Port au Choix or on Pointe Riche. The vast extent and depth of the long-weathered and superficially arid debris is beautifully exhibited on near-by St. John's Island (PLATE 235).¹

The coast of western Newfoundland, although fringed late into the spring with ice, which in winter has extended into the Gulf of St. Lawrence or across the Straits of Belle Isle, is not sufficiently cold to be comparable with the true Arctic; and it is decidedly warmer than the north side of the Straits and the outer coast of Labrador, where the south-flowing Labrador current carries icebergs and drift-ice far into the summer. It would seem, then, that the persistence of so extensive an element of the Arctic flora along the outer coast of western Newfoundland is due more to the aridity and the calcareous nature of the exposed ledges and the deep mantle of weathered debris than to low temperature; and that the flora of the rock barrens of the coast of western Newfoundland is largely composed of Arctic species because on these barrens are found arid conditions and calcareous soils comparable with those of much of the Arctic Archipelago where, as Simmons and others before him have pointed out, aridity is "the most prominent and important factor." Since the long-weathered superficial soils have, by continuous leaching, lost much of their alkalinity and have developed carpets of ancient acid peats, oxylophytes, such as *Hierochloa alpina*, *Carex concolor*, *Juncus trifidus*, *Salix Uva-ursi*, *Potentilla tridentata*, *Empetrum nigrum*, *Loiseleuria procumbens* and *Diapensia lapponica*, are not excluded. They, also, are xerophytes and unless the weathered and leached limestones were arid we should scarcely look for them there.

¹ Other illustrations of this arid mantle at sea-level are in RHODORA, xxviii. t. 153, fig. 2 and t. 154, fig. 3 (1926).

The excessive dwarfing and crowding of internodes, as well as reduction of leaves and increase of blanket-coats of trichomes or other xerophytic modifications of high-arctic and high-alpine plants are familiar to every one. In eastern America it is quite unnecessary, however, to go either to the Arctic or to the alpine summits to get the most beautiful illustrations of such nanism. At sea-level in western Newfoundland (in the latitudes of London, Paris, Berlin, Vienna, Winnipeg, Duluth and Vancouver) the arid limestone gravels supply endless fascinating illustrations (PLATES 239 and 240). *Solidago macrophylla*, the woodland species of southern Canada and the mountain woods of the northern states, where it attains a height of a meter or more, wandering out to the dry barrens of Newfoundland, will flower when only 3 cm. high (PLATE 239, FIG. 1). *Senecio pauperculus*, in New England and Pennsylvania often 5 or 6 dm. high and with 15–20 heads, is the tiniest of dwarfs (PLATE 239, FIG. 2) on far-from-rich Pointe Riche. *Saxifraga oppositifolia*, which, on the damp walls of the Green Mts., may trail as broad carpets, with internodes up to 1 cm. long and flower-stalks twice as long, on these arid barrens has densely crowded leaves and sessile flowers (PLATE 239, FIG. 3). On cool and damp walls in western Newfoundland and eastern Quebec *Saxifraga cespitosa* L. often has its tufts (cespites) of leaves lax and elongate (up to 1 dm. long), with the thin and fan-like leaves 2 cm. or more long, with scapes up to 2 dm. high. Not so on the extremest of arid sea-shore barrens of Newfoundland (as at Plum Point) where the mats (PLATE 239, FIG. 4) are positively absurd in their condensation. Willows and birches, which in damp and sheltered thickets reach heights of 1–3 m., on these barrens are absolutely prostrate, with stout and ancient matted trunks and marvellously reduced foliage. *Potentilla fruticosa*, "Widdy," which, on damp barrens of Newfoundland, forms knee-high to waist-high dense thickets, abundant and coarse enough to be used as emergency fire-wood,¹ wanders out to dry barrens and becomes almost unrecognizable (PLATE 240, FIG. 1). *Potentilla nivalis*, on damp or turfy slopes of Newfoundland or Gaspé often forming loose mats, with leaflets 2.5–3 cm. long, is forced to struggle on the dry gravels, making wonderful little columns (PLATE 240, FIG. 2) dating back a full half-century (as shown by the marcescent bases of old rosettes) and with tap-roots de-

¹ When I asked a native of Bonavista Bay how they prepare "Widdy" for fire-wood, he replied: "We rips up de whole tree, roots and all."

scending straight down for 3 or 4 dm. So with *Lesquerella* (PLATE 240, FIG. 3), the plants reduced to ancient obconic crowns. The succulent (and edible) Roseroot, *Sedum roseum*, on damp rocks growing strong, with many stems 2–3 dm. high and leaves 2–3 cm. long, can stand hard conditions; but the most arid barrens reduce it to a stature often of only 3 cm. *Draba incana* L., given a good opportunity, grows 3 dm. high, with large scattered leaves; but, like the *Sedum*, it can maintain itself on the driest of Newfoundland barrens by condensation to a height of 2 cm. (PLATE 239, FIG. 5). Seaside Plantain, *Plantago juncoides* Lam. (*decipiens* Barneoud), which in favorable conditions may have leaves 2 dm. long and 1 cm. or more broad, with scapes 2 dm. high and spikes 1 dm. long, is almost too minute (PLATE 240, FIG. 4) to be seen in the dry gravel. *Poa alpina* has the leaves distichous, at least theoretically; but the character is often not easily seen in the lush plants of mountain meadows and wet rocks, plants up to 6.5 dm. high, with broad leaves half as long and pyramidal panicles often 1 dm. in diameter. When, however, *P. alpina* gets into the driest of barrens it cuts out all overgrowth and the strongly marked distichous character of the foliage becomes emphasized (PLATE 240, FIG. 5). *Euphrasia*, too, although annual, responds quickly to the arid habitat. On shores with plenty of moisture *E. purpurea* var. *Farlowii* may be loosely branched and 1 dm. high, with internodes 1 cm. long. On the dry barrens, however, it is content with a full height of 1 or 2 cm.

Already nearly half the known species of the Arctic American Archipelago are known from sea-level in western Newfoundland. In view of the fact that in many cases these species are known only as the rarest of localized relics and in view, furthermore, of the vast extent of unexplored barrens on the West Coast, it should not surprise us if, eventually, practically the complete Arctic American flora is found to grow in this arid section of temperate North America.

Part III. SOME TAXONOMIC RESULTS OF RECENT COLLECTIONS IN NEWFOUNDLAND.

In the following notes range-extensions chiefly of considerable magnitude are recorded; and, since it has been imperative to study anew many groups, the revisions of such as are largely represented in Newfoundland are included. Some groups, however, still under revision or awaiting fuller study, are necessarily omitted. Besides our own

collections a few others of special note should be mentioned. Mrs. Sinclair Kennedy (Rachel B. Kennedy) has already reported¹ on some of her discoveries in southwestern Newfoundland; Mrs. George W. Jeffers (Anne M. Jeffers) collected in 1929 about Raleigh, on Pistolet Bay, and added materially to our knowledge of that fascinating region; Mrs. Harold Ayre (Agnes M. Ayre) has been very active on the Avalon Peninsula, where she has added some very striking Atlantic European species to the known flora of Newfoundland; in 1930, Mr. K. P. Jansson spent considerable time in the region of Millertown, near where one of my parties had done extensive botanizing in 1911, and, afterward, in a brief trip to Bonne Bay, he added two species to the Newfoundland flora. Some of the more significant of these discoveries by others are added to our own.²

WOODSIA ALPINA (Bolton) S. F. Gray. To the very few Newfoundland stations add the following. **BONNE BAY:** limestone rocks near crest (alt. 650 m.), Killdevil, *Fernald, Long & Fogg*, no. 1115.

W. GLABELLA R. Br. The following are new stations. **BONNE BAY:** crevices of limestone cliffs, very scarce, Tucker's Head, and crevice of limestone cliff opposite Lomond, *Fernald, Long & Fogg*, nos. 1117, 1118. **LOWER HUMBER VALLEY:** very rare, crevices of dry limestone, Hannah's Head, no. 1116.

THELYPTERIS NOVEBORACENSIS (L.) Nieuwl. The northern limit in Newfoundland seems to be at **BONNE BAY:** boggy spruce thickets near Winterhouse Brook, *Fernald, Long & Fogg*, no. 1125.

T. ROBERTIANA (Hoffm.) Slosson. Apparently more frequent on limestones of the West Coast than previously supposed. The following are the new stations. **ST. JOHN BAY:** wooded talus of limestone cliff, Crow's Head, *Fernald, Long & Fogg*, no. 1129. **BONNE BAY:** talus of limestone cliffs near Stanleyville, no. 1130; bushy talus of limestone cliff, Lord-and-Lady Cove, no. 1131. **BAY OF ISLANDS:** turf over limestone talus, Druid's (or Raglan) Head, no. 1127; spruce thicket at base of limestone cliff west of Big Barachois, no. 1128. **LOWER HUMBER VALLEY:** crevices of dry limestone, Hannah's Head, no. 1126. Plant gummy, aromatic; large plants more than 4 dm. high, with fronds 2 dm. broad.

T. CRISTATA (L.) Nieuwl. A new northeastern limit is the following. **ST. JOHN BAY:** bushy swale back of Eddy's (or Old Man's) Cove, *Fernald, Long & Fogg*, no. 1135. Plants fruiting but very small, up to 2.2 dm. high.

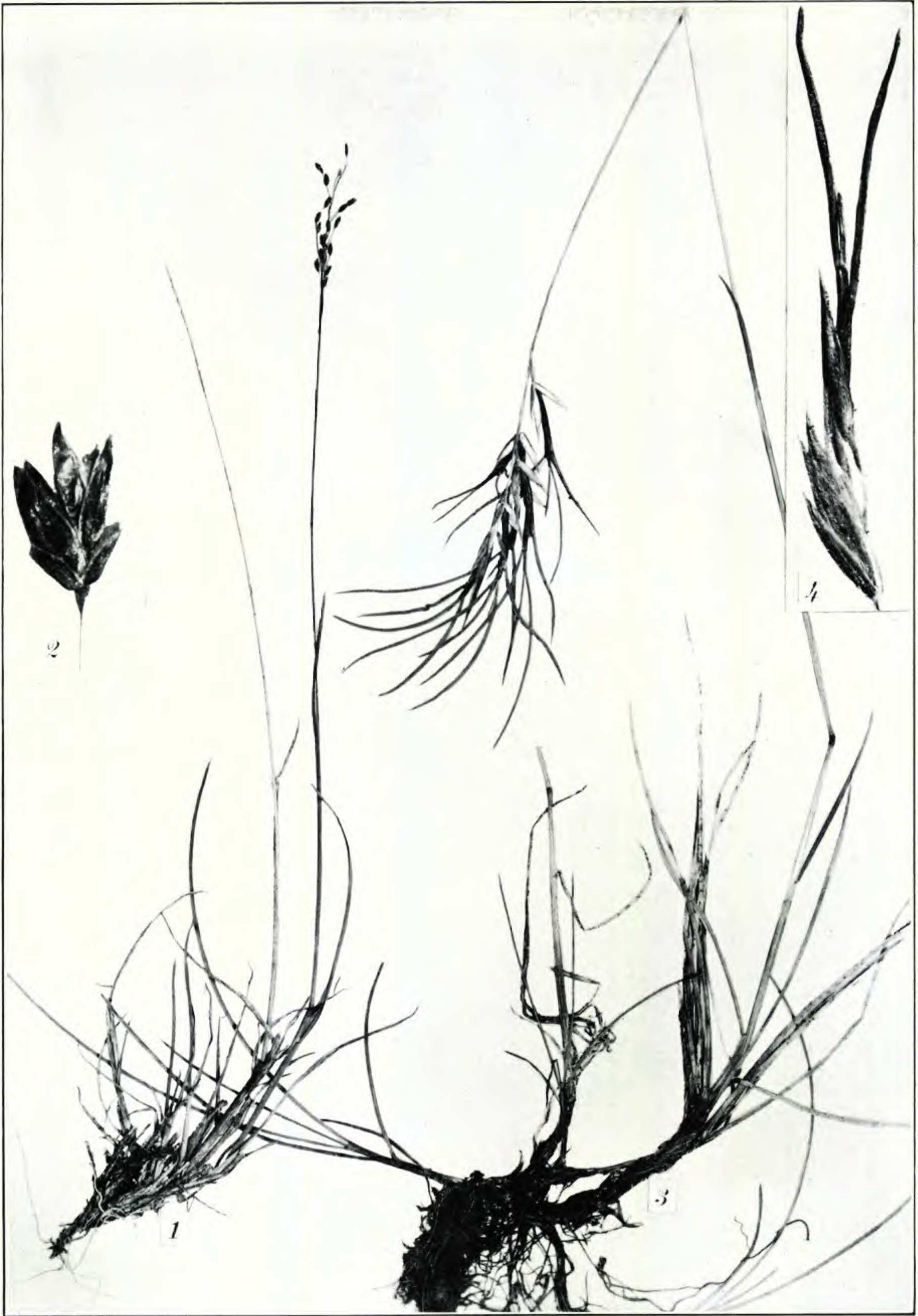
**ATHYRIUM FILIX-FEMINA* (L.) Roth, var. *SITCHENSE* Rupr. See Butters, *RHODORA*, xix. 204 (1917). Collections of 1923, misidentified

¹ *Some Additions to the Newfoundland Flora*, *RHODORA*, xxii. 3-4 (1930); *Further Notes from Southwestern Newfoundland*, *RHODORA*, xxiii, 207-209, tt. 216, 217 (1931).

² In the following notes species not previously recorded from Newfoundland are indicated by an asterisk,



NANISM AT SEALEVEL IN WESTERN NEWFOUNDLAND: FIG. 1, *POTENTILLA FRUTICOSA*; FIG. 2, *P. NIVEA*; FIG. 3, *LESQUERELLA ARCTICA*, var. *PURSHII*; FIG. 4, *PLANTAGO JUNCOIDES*, var. *GLAUCA*; FIG. 5, *POA ALPINA*.



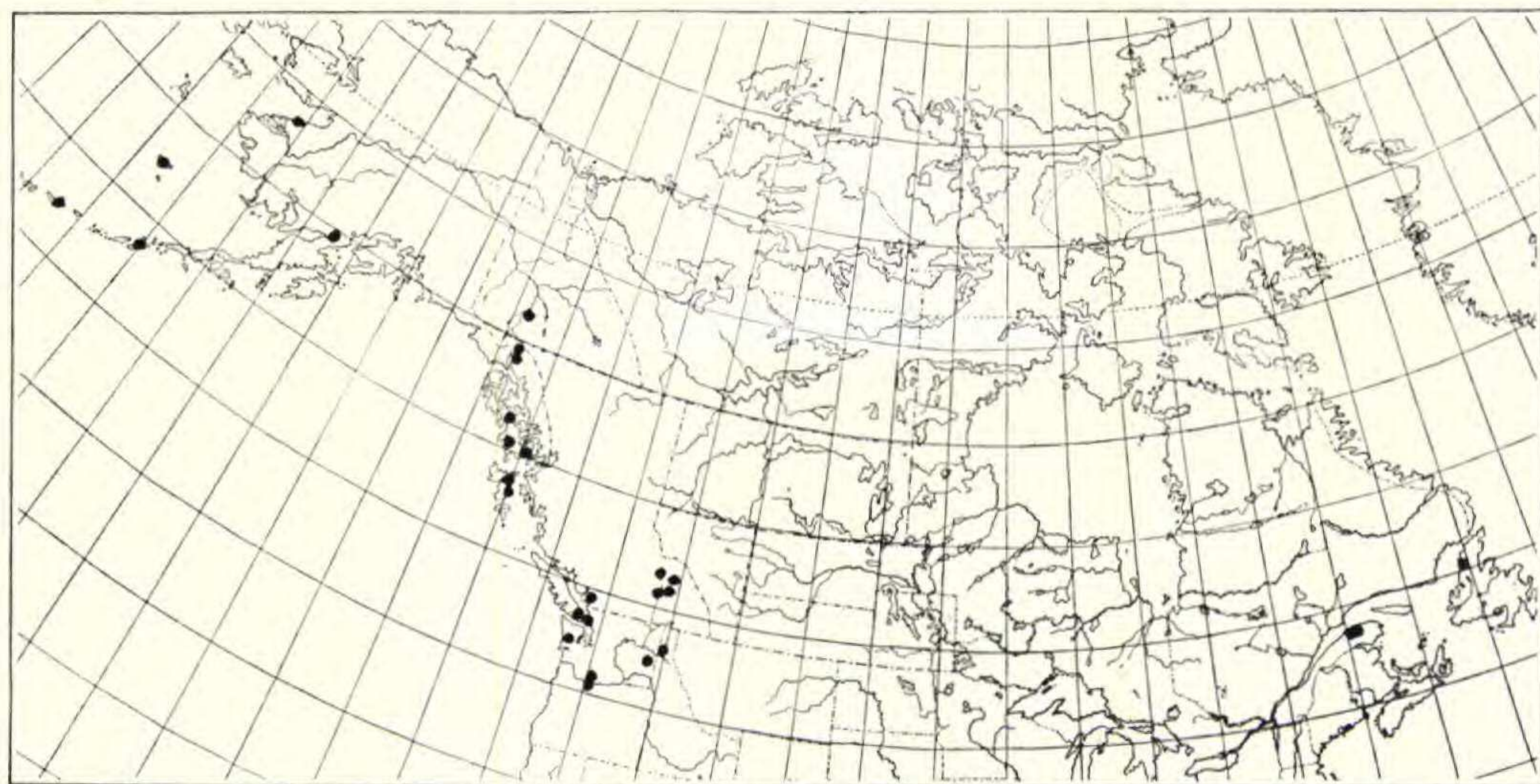
MUHLENBERGIA UNIFLORA, var. TERRAE-NOVAE: FIG. 1, habit, $\times 1$; FIG. 2, spikelet, $\times 10$.

FESTUCA PROLIFERA, var. LASIOLEPIS, TYPE collection: FIG. 3, habit, $\times 1$; FIG. 4, spikelet, $\times 4$.

and distributed as *A. angustum*, var. *rubellum*, prove to be this characteristic plant of northwestern America. The Newfoundland stations follow. HIGHLANDS OF ST. JOHN: thickets below limestone escarpment, western face of Bard Harbor Hill, *Fernald & Long*, no. 27,240; steep springy quartzite banks of brook, Southwest Gulch, Bard Harbor Hill, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, no. 27,241.

The only other stations known in eastern North America are on the Shickshock Mts. of Gaspé and Matane Cos., Quebec. MAP 13.

A. ALPESTRE (Hoppe) Rylands. The plant of Bard Harbor Hill reported in *RHODORA*, xxviii. 148 (1926) as var. *americanum* seems to be nearer the typical European *A. alpestre* (See Fernald, *RHODORA*, xxx. 47, 48, tt. 165, 166 (1928)). The following is an addition to the



Map 13. Range of *ATHYRIUM FILIX-FEMINA*, var. *SITCHENSE*.

Newfoundland collections there cited. HIGHLANDS OF ST. JOHN: wet quartzite rocks along Yellow Brook, Doctor Hill, *Fernald, Long & Fogg*, no. 1153.

ADIANTUM PEDATUM L., var. *ALEUTICUM* Rupr. Typical, especially of magnesian rock, near the West Coast. The following are recent new stations. BONNE BAY: wet rocks by waterfall, Shoal Brook, *Fernald, Long & Fogg*, no. 1163; talus of limestone cliff opposite Lomond, no. 1164. BAY OF ISLANDS: wet depressions and borders of rills, serpentine ridge, North Arm, and dry serpentine ridge, North Arm, *Long & Fogg*, nos. 6 and 8; by rill, serpentine ledges, Red Rocks, Lark Mountain, *Fernald*, no. 7.

Typical *Adiantum pedatum* is unknown in Newfoundland, although, through confusion of the French *Capillaire* (*Adiantum Capillus-Veneris*) with the Newfoundland CAPILLAIRE or MAIDENHAIR BERRY,

Chiogenes hispidula of the *Ericaceae*, it has been reported. Thus, Sir Richard Bonnycastle, writing of Newfoundland plants with assurance but with "first-hand unfamiliarity" with them, naïvely stated: "The maiden hair (*Adiantum pedatum*) is a little trailing plant, seeking sheltered places, and is one of the most beautiful of the family of filices, or ferns. It bears a little fruit, white, and like an ant's egg, which contains so much saccharine matter as to be lusciously sweet when made into a jam or preserve. It is occasionally brought to families here by the girls who follow the berry-picking trade; but it is preserved and not used for capillaire, as in Canada [referring to medicinal use of *Adiantum*]."

BOTRYCHIUM SIMPLEX E. Hitchc. Apparently rare in Newfoundland, but more probably overlooked. The following are recent collections. **BAY OF ISLANDS**: dry gravelly slope, Lark Harbor, *Fernald, Long & Fogg*, no. 18; turfy pasture-slope, Curling, *Fernald, Long & Fogg*, no. 1171; sterile turfy slope, Petrie's, *Fernald & Long*, no. 1172.

***B. ANGUSTISEGMENTUM** (Pease & Moore) Fernald, *RHODORA*, xvii. 87 (1915). **BAY OF ISLANDS**: very scarce, on sterile turfy slope, Petrie's, *Fernald & Long*, no. 1174, growing with *B. simplex* and *B. matricariaefolium* A. Br.; the station, indicated to us by Mr. Frank Morris, the first east of central New Brunswick. See p. 95.

EQUISETUM PRATENSE Ehrh. Reported for the first time in Newfoundland in *RHODORA*, xxviii. 149 (1926), from St. John Bay. Extending south at least to **BAY OF ISLANDS**: thicket near Morley's Pond, *Fernald, Long & Fogg*, no. 1182.

LYCOPodium CLAVATUM L. The northern known limit on the West Coast is on **ST. JOHN BAY**: spruce thicket on dry heath-barren southwest of Port au Choix, *Fernald, Long & Fogg*, no. 1191.

L. OBSCURUM L. The northern known limit on the West Coast is on **BONNE BAY**: dry spruce woods, Island Cove, Main (or East) Arm, *Fernald, Long & Fogg*, no. 1193.

L. SABINAEFOLIUM Willd., var. **SITCHENSE** (Rupr.) Fern. *RHODORA*, xxv. 166 (1923). The northernmost station known on the West Coast is on **BONNE BAY**: peaty and turfy upper quartzite slope (alt. 600-650 m., Killdevil, *Fernald, Long & Fogg*, no. 1195).

***L. COMPLANATUM** L., var. **CANADENSE** Victorin, *Contrib. Lab. Bot. Univ. Montréal*, no. iii. 70 (1925). **BAY OF ISLANDS**: peaty and gravelly thicket, French (or Tweed) Island, *Fernald, Long & Fogg*, no. 34.

L. TRISTACHYUM Pursh. The northern known limit on the West Coast is in the **LOWER HUMBER VALLEY**: dry limestone gravel, Hannah's Head, *Fernald & Long*, no. 1196.

PINUS STROBUS L. The northern limit on the West Coast seems to be at Bonne Bay, where, we are told, it has been common on sheltered areas. The extraordinary *f. **PROSTRATA** (Mast.) Fern. & Weath.,

RHODORA, xxxiv. 168 (1932), occurs on the bleak serpentine mountains of BAY OF ISLANDS: Blomidon, *Mackenzie & Griscom*, no. 10,032; North Arm, *Long & Fogg*, no. 37. See p. 11.

TYPHA LATIFOLIA L. BONNE BAY: bushy margin of open savannah near mouth of Main River, plants all sterile, *Fernald & Long*, no. 1202.

Said by Mr. W. A. Preble to be abundant, and regularly harvested for "flags" in barrel-making, at Baker Brook, 12 miles north of Bonne Bay. See p. 90.

SPARGANIUM MULTIPEDUNCULATUM (Morong) Rydb. See Fernald, RHODORA, xxvii. 190 (1925). To the two recorded stations in Newfoundland add the following. AVALON PENINSULA: 20-Mile Pond (Windsor Lake), *A. M. Ayre*. BAY OF ISLANDS: marshy border of pond at foot of serpentine ridge, North Arm, *Long & Fogg*, no. 42.

POTAMOGETON CONFERVOIDES Reichenb. The northernmost known stations are at BONNE BAY: shallow pools in bog-barrens at 400–550 m. alt., tableland of Lookout Mountain, *Fernald, Long & Fogg*, no. 1206; alpine ponds, July 28, 1930, *K. P. Jansson*. See p. 85.

P. GRAMINEUS L., var. SPATHULAEFORMIS Robbins. To the very few Newfoundland stations add ST. JOHN BAY: shallow marl-pond in limestone barren, Eastern Point, *Fernald, Long & Fogg*, no. 1209.

P. PRAELONGUS Wulfen. To the small number of Newfoundland stations add BAY OF ISLANDS: Morley's Pond, *Fernald, Long & Fogg*, no. 1211. See p. 14.

P. BUPLEUROIDES Fern. The northernmost known station is at the head of BONNE BAY: brackish tidal mud-flats at mouth of Main River, *Fernald, Long & Fogg*, no. 1212.

*RUPPIA MARITIMA L., var. OBLIQUA (Schur) Aschers. & Graebn. See Fernald & Wiegand, RHODORA, xvi. 123 (1914). BONNE BAY: brackish tidal mud-flats at mouth of Main River, *Fernald, Long & Fogg*, no. 1214. See p. 91.

*R. MARITIMA, var. INTERMEDIA (Thedenius) Aschers. & Graebn. See Fernald & Wiegand, l. c. 124 (1914). BONNE BAY: with the latter in brackish tidal mud at mouth of Main River, *Fernald, Long & Fogg*, no. 1215.

Heretofore known in eastern North America only from Rimouski Co., Quebec (Trois Pistoles, *Fernald & Pease*, no. 24,826). See p. 91.

*R. MARITIMA, var. BREVIROSTRIS Agardh. See Fernald & Wiegand, l. c. BONNE BAY: with the two preceding, brackish tidal mud-flats at mouth of Main River, *Fernald, Long & Fogg*, no. 1216.

Heretofore known in America only from pools on the Côte Nord, the Mingan Islands and the Magdalen Islands. See p. 91.

*R. MARITIMA, var. ROSTRATA Agardh. See Fernald & Wiegand, l. c. 125. DISTRICT OF BURGEO AND LA POILE: pool in brackish sand back of Sand Bank, west of Burgeo, *Fernald, Long & Fogg*, no. 47. BAY OF ISLANDS: brook in salt marsh, Lark Harbor, no. 46.

Forma MEGASTACHYS (Gaud.) Holmb. NOTRE DAME BAY: Baccalieu Island, July, 1902, *Sornborger*; shores of Pike's Arm, *Fernald, Wiegand & Bartram*, no. 4662.

*F. RUBRA, var. MUTICA Hartm. Extending from Greenland south to Newfoundland, Anticosti and the Gaspé Peninsula. EXPLOITS VALLEY: railroad gravel, Millertown Junction, *Fernald, Wiegand & Darlington*, no. 4658. HIGHLANDS OF ST. JOHN: springy cliffs and talus above Overfall of Deer Pond Brook, *Wiegand, Gilbert and Hotchkiss*, no. 27,376.

*F. RUBRA, var. COMMUTATA Gaud. (Var. *fallax* (Thuill.) Hackel). EXPLOITS VALLEY: portage route from Depot Camp on Mary Ann Lake to Junction Brook, *Fernald, Wiegand & Bartram*, no. 4661; gravelly bank near Rushy Pond, *Fernald, Wiegand, Bartram & Darlington*, no. 4667. BAY OF ISLANDS: boggy meadows and wet grassy slopes, Birchy Cove (Curling), *Fernald, Wiegand & Kittredge*, no. 2672.

*F. RUBRA, var. MULTIFLORA (Hoffm.) Aschers. & Graebn. AVALON PENINSULA: gravelly railroad bank between Waterford Bridge and St. John's, *Fernald & Wiegand*, no. 4666. HA-HA BAY: strand south of Raleigh, *Wiegand, Gilbert & Hotchkiss*, no. 27,375. BAY OF ISLANDS: woods and thickets on slaty brookside, Curling, *Fernald, Long & Fogg*, no. 1230.

*F. RUBRA, var. ARENARIA (Osbeck) Fries. AVALON PENINSULA: damp mossy or turfy hollows on hill south of St. John's, *Fernald & Wiegand*, no. 4664. VALLEY OF GANDER RIVER: dry gravelly bank, Glenwood, *Fernald, Wiegand & Darlington*, no. 4667. BONNE BAY: limestone ledges and talus, Shag Cliff, *Fernald, Long & Fogg*, no. 1233. BAY OF ISLANDS: turfy spots on slaty calcareous talus, Cutwater Head, *Fernald, Long & Fogg*, no. 1231; meadow on Governor Island, *Eames & Godfrey*, no. 5872.

*F. RUBRA, var. JUNCEA (Hackel) Richter. AVALON PENINSULA: rocky soil, base of cliff, Bell Island, Conception Bay, *Howe & Lang*, no. 1283. BONNE BAY: serpentine tableland, Bonne Bay, *Fernald, Wiegand & Kittredge*, no. 2669. BAY OF ISLANDS: gravelly shore, Blomidon Brook, *Mackenzie & Griscom*, no. 10,095. BAY ST. GEORGE: Barachois Brook, *R. B. Kennedy*, no. 37.

FESTUCA **prolifera** (Piper), comb. nov. *F. rubra prolifera* Piper, Contrib. U. S. Nat. Herb. x. 21 (1906). MAP 14.

The alpine plant of the highest mountains of New Hampshire, Maine, Quebec and Newfoundland (as well as lower stations on the limestones of Gaspé, Anticosti and Newfoundland) has never seemed to me like a mere viviparous state of the lowland *Festuca rubra* L., a species which abounds at sea-level and primarily on silicious soils throughout the coastal area from Labrador to New Jersey and even to the Carolinas. Yet, when he published it as a subspecies Piper hesitated to accord it rank higher than a "state" of *F. rubra*.

The plant of the White Mountains which has been referred to *F. ovina vivipara* L. is in reality a viviparous form or state of *F. rubra*, differing only in its viviparous spikelets. It is said to be the only form of the plant in the White Mountains, and while properly a state rather than a subspecies, may be named as above. It seems surprising that no similar form occurs in Europe.

Since Piper wrote the above paragraph I have had much experience with the alpine plant. In its reddish and membranaceous basal sheaths coarsely ribbed and quickly disintegrating into loose fibers and its usually loose habit of growth, it is certainly nearer to the complex *Festuca rubra* L. than to *F. ovina* L. and the other eastern North



Map 14. Range of *FESTUCA PROLIFERA*.

American relatives of *F. ovina*, *F. brachyphylla* Schultes, *F. vivipara* (L.) Sm.¹ and *F. capillata* Lam., in all of which the basal sheaths are whitish and coriaceous, scarcely costate and not readily disintegrating. In the latter group of species (Sect. *Ovinae*, subsect. *Intravaginales* Hackel) the anthers are only one-third to one-half as long as the palea; in *F. ovina* 2.5–3 mm. long, in *F. brachyphylla* 0.5–1 mm., in *F. vivipara* unknown, in *F. capillata* 1.5–2 mm. *F. rubra*, however, in its multiform variations has the anthers longer, one-half to three-fourths the length of the palea, in our eastern American

varieties 2.5–4.5 mm. long.

Ordinarily the alpine *Festuca prolifera* of calcareous to circumneutral areas does not bear fertile spikelets, but in 1929, on the limestone cliffs about Bonne Bay in Newfoundland, Messrs. Long, Fogg and I were fortunate enough to secure it with the normal simple racemes of viviparous spikelets mixed on some individuals with non-viviparous spikelets bearing anthers. The well developed anthers are only 1.5–2 mm. long; and the well developed lemmas are awnless, either quite mucous or merely attenuate to pointed, but not with awned tips. Similar lemmas are found on all specimens in which they have not

¹ For note on the specific distinctions of *F. vivipara* see Fernald, RHODORA, xxviii-151 (1926).

changed to leafy tufts and in texture they are decidedly more membranaceous than in *F. rubra*. The latter species, except in rare cases (in which, however, the large anthers are regularly developed) has distinctly awned lemmas. In *F. rubra*, likewise, the inflorescence in all well developed plants is clearly a panicle, with at least the lower branches forking, bearing 9–70 firm spikelets, or in some of the arctic forms with the spikelets closely crowded. In *F. prolifera*, on the other hand, the inflorescence is a simple flexuous raceme of 3 to 8 spikelets, the lowest branch rarely bearing a second sessile spikelet.

With many morphological characters and great constancy and with a very definite restriction to cold or alpine habitats in calcareous or other basic or neutral soils, *Festuca prolifera* seems to be a clear-cut endemic species of eastern North America. In its basal sheaths and loosely cespitose to subrepent habit it is related to *F. rubra*. In its awnless and membranous lemmas and in its almost uniformly proliferous habit it is close to *F. vivipara*, which reaches its southern limit at the northern limit of *F. prolifera* (the Shichshock Mts. and western Newfoundland). In its membranous and awnless lemmas it is similar, also, to *F. brachyphylla*, which extends south to western Newfoundland, the Shichshock Mts. and northern Vermont, but which has the basal sheaths of *F. ovina* and the anthers only 0.5–1 mm. long. In size of anther *F. prolifera* matches *F. capillata* but there the resemblance ceases, *F. capillata* with the sheaths of *F. ovina*, densely cespitose habit, and short coriaceous or chartaceous tightly inrolled lemmas.

Festuca prolifera occurs in two extremes: the typical plant of the White Mountains and the Gaspé Peninsula, as well as southwestern Newfoundland, with glabrous spikelets; and the more northern plant (of midwestern Newfoundland and Anticosti), with lemmas pilose. The two extremes are represented by the following collections.

F. PROLIFERA (typical). Spikelets glabrous.—NEWFOUNDLAND: shelves of limestone cliff, Druid's (or Raglan) Head, Bay of Islands, *Fernald, Long & Fogg*, no. 1235; talus slope of the marble region between Mt. Musgrave and Humbermouth, *Fernald, Wiegand & Kittredge*, no. 2670, in part (mixed with *F. brachyphylla*); dry limestone barrens, upper slopes and tablelands, alt. 200–300 m., Table Mt., Port au Port Bay, *Fernald, Wiegand & Kittredge*, no. 2668 (transition to var. *lasiolepis*), *Fernald & St. John*, no. 10,788. QUEBEC: abrupt western calcareous slopes, alt. 1000–1100 m., Tabletop Mts., *Fernald & Collins*, no. 364; wet rocks and chimneys, alt. 825–1125 m., Northeast Branch of R. Ste. Anne des Monts, Tabletop Mts.,

Fernald, Dodge & Smith, no. 25,433; gravelly and sandy beaches and bars, R. Ste. Anne des Monts, *Fernald & Collins*, no. 415; damp rocks, waterfall of Ouillet Brook, Mt. Fortin, *Fernald & Pease*, no. 24,904; wet calcareous cliffs and ledges, northern base of Mt. Collins, *Fernald, Griscom, Mackenzie, Pease & Smith*, no. 25,431; dry talus and ledges of green schists, alt. 900–1125 m., Hanging Valley, Mt. Pembroke, *Griscom & Pease*, no. 25,432; cold chimneys in the schists at about 900–1000 m. alt., Fernald Pass, Mt. Mattaouisse, *Fernald & Smith*, no. 25,434. MAINE: slide, West Wall of North Basin, Mt. Katahdin, July 13, 1900, *Fernald*. NEW HAMPSHIRE: in alpinis Montium Alborum, *Wm. Oakes*; White Mountains, in alpibus cum *Oxyria*, *Tuckerman*; alpine brooks, Mt. Washington, September 2, 1877, *Pringle* (TYPE-COLLECTION); Gulf of Mexico, Mt. Washington, August 5, 1855, *Wm. Boott*; Great Gulf, Mt. Washington, July 29, 1887, *Faxon*, July 7, 1895, *Kennedy*, *Churchill*, August 10, 1896, *Faxon*; head of Great Gulf, alt. 5500 ft., *Pease*, no. 12,878; Alpine Garden above Raymond's Cascade, Mt. Washington, August 5, 1897, *E. F. Williams*.

*Var. **lasiolepis**, var. nov. (TAB. 241, FIGS. 3 and 4), lemmatibus pilosis.—Calcareous region of western Newfoundland and Anticosti Island. NEWFOUNDLAND: limestone cliffs near Stanleyville, Bonne Bay, August 9, 1929, *Fernald, Long & Fogg*, no. 1236 (TYPE in Gray Herb., some spikelets fertile); talus of limestone cliff opposite Lomond, Bonne Bay, August 19, 1929, *Fernald, Long & Fogg*, no. 1237; turf slopes below limestone crests (alt. 650 m.), Killdevil, no. 1238; dry humus over limestone ledges and shingle, Hannah's Head, lower Humber valley, July 12, 1929, *Fernald, Long & Fogg*, no. 1242. QUEBEC: Rivière Vaureal, Anticosti, 28 juillet 1925, *Victorin, Rolland-Germain & Louis-Marie*, no. 20,578; humus humide sur le calcaire, R. au Fusil, Anticosti, 19 août 1926, *Victorin & Rolland*, no. 24,775; dans l'humus humide calcaire, R. Jupiter, Anticosti, 12 août 1926, *Victorin & Rolland*, no. 24,776 (passing to typical *F. prolifera*); cailloutis calcaires, R. Galiote, Anticosti, 14 août 1926, *Victorin & Rolland*, no. 24,782; sur les platières récentes, avec *Braya humilis*, etc., R. Chicotte, Anticosti, *Victorin & Rolland*, no. 27,872; le long des rivages calcaires, R. de la Chute, Anticosti, 21 juillet 1927, *Victorin & Rolland*, no. 27,884; sur les platières en haut des gorges, R. au Fusil, Anticosti, 20 juillet 1927, *Victorin & Rolland*, no. 27,885.

POA LAXA Haenke. An additional station on the HIGHLANDS OF ST. JOHN: quartzite cliffs and ledges of Deep Gulch, Doctor Hill, *Fernald, Long & Fogg*, nos. 1252, 1253. See p. 58.

P. TRIVIALIS L. As stated on p. 83, *Poa trivialis* has every appearance of being indigenous (though sometimes also introduced) in Newfoundland. Near the West Coast it is typical of peaty openings, glades or shores as well as on cliffs and talus or around springy spots.

P. SALTUENSIS Fern. & Wieg., var. MICROLEPIS Fern. & Wieg. RHODORA, xx. 124 (1918). The northern limit seems to be on BONNE BAY: woods and thickets near mouth of Middle Brook, *Fernald, Long & Fogg*, no. 1275.

DACTYLIS GLOMERATA L. In eastern North America the Eurasian Orchard Grass is thoroughly naturalized. Three of the varieties occur with us (two of them in Newfoundland, the third likely to be found there). Typical *D. GLOMERATA*, common near settlements as far north as Bonne Bay, has the glumes and lemmas with long-ciliate keels but glabrous backs. Var. *ciliata* Peterm. (not yet known in Newfoundland) is similar, but with glumes and lemmas pubescent on the back.

**D. GLOMERATA*, var. *DETONSA* Fries. Keels merely scabrous or short-hispid, not long-ciliate. BONNE BAY: swale at old camp-site, mouth of Main River, *Fernald, Long & Fogg*, no. 1276. Probably introduced in hay or straw, and presumably more generally naturalized.

CYNOSURUS CRISTATUS L.

In his unpublished manuscript, *Essai sur la Flore de Terre-Neuve et des Iles St. Pierre et Miquelon*, based on his collections made from 1816–1820, and preserved in the general library of the Muséum d'Histoire Naturelle at Paris, where I had the privilege of consulting it in September, 1930, through the great kindness of the Chief Librarian, Dr. Léon Bultingaire, and his very helpful assistant, Mme. de Mouricaud, Bachelot de la Pylaie seemed to regard *Cynosurus* as indigenous in Newfoundland and the French Islands: "Cette espèce croît à l'île St. Pierre dans les terrains inférieurs, parmi les autres graminées qui forment des espèces de prairies naturelles: elle se trouve aussi à Terre-neuve dans semblables localités, le long des ruisseaux et des rivières, au bord des bois." The numerous collections from about the Bay of Islands and from the Avalon Peninsula (*Mrs. Ayre*) seem to be introductions; and Brother Arsène considered it (*RHODORA*, xxix. 207) an introduction on St. Pierre et Miquelon.

In the same manuscript La Pylaie recorded **MOLINIA CAERULEA* (L.) Moench as a native of boggy barrens near the West Coast, saying (under *Melica caerulea* L.): "Cette plante croît dans les landes dures et marécageuses qui se trouvent sur la côte occidentale de Terre-neuve, à une certaine distance du rivage: elle est rare. . . La plante ne diffère pas de celle qui croît en Europe." As yet this rare species has not been rediscovered in western Newfoundland but the habitat is right for *Molinia*, which should confidently be sought.

CATABROSA AQUATICA (L.) Beauv., var. **laurentiana**, var. nov. (TAB. 242, FIGS. 3 and 4), foliis caulinis subacutis vel obtusis nec apice rotundatis; culmo valde grosseque sulcato; paniculis contractis lanceolatis vel anguste ovoideis 2–16 cm. longis 1–8 cm. diametro, internodiis imis 0.7–3 cm. longis, ramis horizontaliter patentibus ad

basin versus floriferis; spiculis ochroleucis vel purpurascensibus 1-2-floris; lemmatibus 2-3 mm. longis.—Springs, rills, pools and fresh to brackish marshes, near the coast, southeastern Labrador, Newfoundland, southeastern Quebec, Magdalen Islands, Prince Edward Island and northeastern New Brunswick. LABRADOR: Seal Islands, 1900, *E. B. Delabarre*. NEWFOUNDLAND: swaley margin of pool in limestone barrens, Capstan Point, Flower Cove, *Fernald, Long & Dunbar*, no. 26,286; turfey and gravelly beaten paths (stunted individuals), Flower Cove, *Fernald & Long*, no. 27,434; borders of springs at foot of limestone sea-cliffs, base of Pointe Riche, *Fernald, Long & Fogg*, no. 1277; wet runs and boggy spots in limestone barrens, near sea-level, Ingornachoix Bay, *Fernald, Wiegand & Kittredge*, no. 2601; boggy brooklet, Channel, *Howe & Lang*, no. 811; cold spring-ditch, Port aux Basques, *Fernald, Long & Dunbar*, no. 26,285. QUEBEC: wet places, Blanc Sablon ("Labrador"), *Fernald & Wiegand*, no. 2600; springy marsh near the shore, Harrington, *St. John*, no. 90,142; sur les rivages calcaires, Pointe-aux-Ammonites, *Victorin & Rolland*, no. 18,225; rivages du lac Salé, Ile à la Chasse, Archipel de Mingan, *Victorin & Rolland*, no. 25,881; le long de la petite rivière, Pointe de l'Est, Anticosti, *Victorin & Rolland*, no. 27,800; cold brook at edge of salt marsh, Ste. Anne des Monts, *Collins & Fernald*, no. 28; border of salt marsh, Capucins, July 28, 1922, *Fernald & Pease*, no. 24,867 (TYPE in Gray Herb.); abundant in a cold brook, mouth of Bonaventure River, July 31, 1902, *Williams & Fernald*; August 2, 3 & 4, 1904, *Collins, Fernald & Pease*; springy holes at edge of salt marsh, Bic, *Fernald & Collins*, no. 872; brackish shore, Cacouna, *Victorin*, no. 595; shore of St. Lawrence, Temiscouata, August 7, 1879, *Pringle*; vicinity of Cap à l'Aigle, *J. Macoun*, no. 68,967. MAGDALEN ISLANDS: brook in springy marsh and wet sand, Grindstone Island, *Fernald, Bartram, Long & St. John*, nos. 6882, 6883; sur les dunes humides, Ile du Hâvre-au-Ber, *Victorin & Rolland*, no. 9040. PRINCE EDWARD ISLAND: cold springy shore, Southport, *Fernald & St. John*, no. 6881; spring-fed marsh, Southport, *Fernald & St. John*, in Pl. Exsicc. Gray. no. 121. NEW BRUNSWICK: fresh to brackish marshy ground, Dalhousie, *Fernald & Pease*, no. 24,868.

I am unable to place the plant of cold springs, rills and pools in eastern Canada, Newfoundland and Labrador with any of the described variations of *Catabrosa aquatica*. The aggregate species has a wide range across Eurasia, north to subarctic regions; in western North America, from Alaska to the Saskatchewan, south, chiefly in the mountains, to Arizona, Colorado and Nebraska; and borders of the Gulf of St. Lawrence and the Straits of Belle Isle. In the latter area, where the plant abounds in cold waters near the fisheries, it might easily be taken to be a recent introduction from Europe, especially as it is as greedily eaten by the cattle as the European plant